IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: RIGNEY et al.	:	
Application No.: 10/086,148	:	Group Art Unit: 3726
Filed: October 22, 2001	:	Examiner: Rosenbaum, Irene.

For: METHOD FOR REPLACING A DAMAGED TBC CERAMIC LAYER

REPLY BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellants replies to those portions of the Examiner's Answer of November 22, 2004 that require a reply, as follows:

7. ***GROUPING OF CLAIMS***

In the Grouping of Claims section, the Examiner disagrees with Appellants' statement in the Appeal Brief that the claims do not stand or fall together. The rules permit the reasons underlying this position to be stated in the flow of the discussion under the Argument section, and that is done on a claim-by-claim basis. The reasons underlying the patentability of every claim are discussed separately within the Argument section of the Appeal Brief. Accordingly, the claims are considered separately. Appellants had inadvertently not identified claim 27 in either the Appeal Brief filed April 19, 2004 or the Supplemental Appeal Brief filed August 23, 2004. In

response, claim 27 stands or falls with independent claim 2 and identifies a turbine component having a surface with a thermal barrier coating system with a localized repair made by process of claim 2.

11. ***ARGUMENTS***

The Examiner acknowledges Appellants' position that Nagaraj et al. ('078) does not disclose a 'predetermined pattern' concerning grooves formed in an article surface by a device teaching the '078 reference. This is to be expected, as the Examiner explicitly conceded on page 2 of the Official Action dated March 24, 2003 that

> "Nagaraj et al fail to state that the spacing, geometry, etc of the grooves is predetermined... Nagaraj et al further fail to teach the particulars of the texturing apparatus (laser beam particulars or electron beam) and the particulars of the groove size and spacing."

While the Examiner fails to acknowledge that Nagaraj et al. ('078) explicitly teaches that grit blasting is capable of producing the desirable combination of surface features equivalent to that produced by laser techniques, as discussed on page 6 in Appellants' Appeal Brief, the Examiner then attempts to equate grooves having 'predetermined' parameters with grooves that have 'random' parameters. In other words, the Examiner is arguing the recitation in claim 2,

> ...texturing the exposed surface to produce a textured surface having an array of spaced grooves of predetermined groove spacing, predetermined groove geometry, and predetermined wall angle with the exposed surface...

(emphasis added) which is based on testing specifically documented in the present invention as filed, is somehow inherently the same to one skilled in the art as randomly formed texturing.

First, it is noted that the Examiner's rejections relies on the doctrine of inherency. MPEP §2112 sets forth the law on inherency. Inherency is not to be taken lightly and not to be asserted unless there is good evidence to suggest that the asserted property or characteristic is necessarily present in the teachings of the prior art reference. The concept of inherency is not provided as a way to fill in the gaps in missing disclosure or teachings based upon speculation, unless the asserted property or characteristic may be shown to be necessarily present by objective evidence. Instead, "inherency" is used when every aspect of the disclosure of a reference and the claimed subject matter are otherwise exactly the same, then it may be inferred that some property or characteristic further recited in the claim must necessarily be present in the art reference. MPEP §2112 provides "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993); In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). (emphasis in MPEP). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted) "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)." (emphasis in original).

Appellants respectfully disagree with the Examiner's conclusion, as previously discussed in its Appeal Brief, that one skilled in the art would direct a laser in a predetermined manner, much less a predetermined groove spacing, predetermined groove

geometry, and predetermined wall angle, especially in light of the fact that the '078 reference provides, column 5, lines 17-19, that grit blasting is capable of producing the desirable combination of surface features equivalent to that produced by laser techniques

The Examiner has failed to provide the basis in fact or technical reasoning that a step in a process of Nagaraj et al. ('078) uses a laser to direct a beam in a predetermined manner having a predetermined groove spacing, predetermined groove geometry, and predetermined wall angle. There is nothing in Nagaraj et al. ('078) to support this assertion.

Second, the Examiner attempts to argue that even if the laser beam pattern employed is not regular (random), one skilled in the art would have made a 'predetermined' decision as to how the laser is to be used, such as to apply the random pattern. By the Examiner's reasoning, 'random' falls within the scope of 'predetermined'. Such reasoning is counterintuitive, and not surprisingly, not supported in a recent decision by the Court of Appeals for the Federal Circuit.

"Predetermine" is defined as "to determine beforehand" or "to impose a direction or tendency on beforehand." Merriam-Webster's Collegiate Dictionary, Tenth Edition, 1999. The same dictionary reference also provides "foreordain, predestine" as synonyms for "predetermine". Conversely, "random" is defined as "lacking a definite plan, purpose, or pattern" or "made, done, or chosen at random (read random passages from the book)". Merriam-Webster's Collegiate Dictionary. As is apparent, the terms are diametrically opposed. Based on these definitions, the terms "predetermined" and "random" would hardly be considered mutually inclusive.

A recent decision in the Court of Appeals for the Federal Circuit involved claims directed to injecting plastic into a mold cavity "in a predetermined general direction". Koito Manufacturing Co. v. Turn-Key Tech. LLC, 72 USPQ2d 1190, 1192 (Fed. Cir. 2004). In Koito, the Federal Circuit upheld the district court's construction of "predetermined", which was given its ordinary meaning, and was found to be "determined beforehand" in the context that "predetermined general direction" meant that the flow direction must be chosen or known before injection. Id. at 1194, 1195. The district court

even further clarified that "predetermined general direction" required intent or foreknowledge in the fixing of plastic flow direction. Id. at 1196.

Similar to Kioto, Appellants assert that disclosed in the present invention as filed, paragraph [0013], page 4, a laser having predetermined parameters is clearly distinguished over the known art, which specifically addressed the '078 reference:

> ...While focused high energy sources such as lasers have been used to prepare engine component surfaces to receive TBC coatings, it is not readily apparent to those skilled in the art what parameters (i.e. groove spacing, geometry and pattern) or focused high energy settings (i.e. power, incidence angles of the energy beam and traverse rate) are required to produce at least adequate resistance to spallation, equivalent to the newly applied coating, of a replacement TBC bonded to the prepared surface compared to the surrounding original coating material. The present invention fulfills this need, and further provides related advantages.

Therefore, Appellants assert that the Examiner has not construed "predetermined" in its normal and ordinary meaning, as clearly intended in the present invention, to "produce a textured surface having an array of spaced grooves of predetermined groove spacing, predetermined groove geometry, and predetermined wall angle" with the exposed surface as recited in claim 2, which clearly is distinguishable from a process used in Nagaraj et al. ('078). (Emphasis added)

The Examiner attempts to argue that Skelly et al. ('971), which is designed to prevent spalling in forming new articles by treating the entire surface of a make-new article, is properly combinable with Nagaraj et al. ('078), that is used to repair an already spalled surface to prevent further spalling from occurring, to render obvious the present invention.

Appellants continue to respectfully traverse this rejection. As stated previously in the Appeal Brief, Nagaraj et al. ('078), as understood, is discussed above and is directed to a method for repairing the thermal barrier coatings on articles that have been damaged by use in the hostile environment in which the ceramic top coating of the thermal barrier coating system has spalled. Skelly et al. ('971), as understood, is directed to an advanced thermal barrier system applied to the surface of an article that is exposed to a hostile

environment to extend the life of the thermal barrier system by preventing the onset of spalling. Both of these inventions are directed at articles used in the hot section of aircraft engines. Skelly et al., in the terminology of those skilled in the art, is directed at "new-make" articles. As such, the system of Skelly et al. is applied to new articles such as turbine blades, and it is applied to the entire surface region that is to be coated with a protective ceramic top coat, and its acknowledged purpose is to extend the life of the new make article. Nagaraj et al. is directed to a locally damaged article that has been removed from service so that it can be repaired and returned to service.

Also as stated previously in the Appeal Brief, Appellants' invention is directed to a method for locally repairing a damaged thermal barrier component from which the ceramic topcoat has been removed, or from which both the ceramic top coat and bond coat have been removed. The Examiner seeks to utilize Nagaraj et al. ('078) directed to a localized repair of a damaged thermal barrier component. However, this reference is deficient in the elements set forth in Appellants' claims, as discussed above. The Examiner, to overcome these deficiencies, provides Skelly et al. ('971) directed to an enhanced thermal barrier coating system, which is applied to a new blade. Appellants respectfully submit that one skilled in the art of thermal barrier coating systems would not look to apply the processing techniques for "new make" turbine components taught by Skelly et al. ('971) to repair the localized repairs required by Nagaraj et al. ('078) in order to arrive at Appellants invention. While Skelly et al. ('971) recognizes the common mechanism for failure of thermal barrier coating systems (see '971 at col. 2, lines 3-8), Skelly et al. is directed to extend the life of new make components by delaying the onset or avoiding this failure mechanism (see '971 at col. 2, line 28-35). The invention of Skelly et al. is applied to the entire surface, which will accommodate the thermal barrier system (see '971 at col. 2, lines 50-59) using preprogrammed numerically- controlled or computer-controlled programs (see'971 at col. 3, lines 20-23 and col. 6, lines 66+). These machines translate the substrate with respect to the machine to produce the pattern. Although the art is related, Appellants submit that one skilled in the art, seeking a solution to the problem of localized repair of thermal barrier topcoats due to spallation or loss of the ceramic topcoat, or ceramic topcoat and underlying bond coat, would not look to the processes and procedures utilized to manufacture new

make articles. The processes and procedures for new-make articles as described in Skelly et al. are designed to prevent spalling, whereas Nagaraj et al. is directed to providing a localized repair to a component, which has already experienced spalling. The processes for new make articles in Skelly et al. are highly automated to accommodate a large number of identical parts. The repairs required by Nagaraj et al. are highly localized, "job-type" repairs, not amenable for adoption to the automated techniques of Skelly et al.

For these reasons, Appellants submit that one skilled in the art, faced with localized repair of thermal barrier coatings such as set forth in Nagaraj et al. is a different problem than that solved by Skelly et al. and thus would not look to new-make articles such as set forth in Skelly et al., which are designed to prevent spalling, for a solution to apply ceramic top coats to localized spalled regions of components such as turbine blades. Even though both are related to thermal barrier coating systems, they solve different problems. Appellants respectfully submit that because the problems solved by Nagaraj et al. and Skelly et al. are sufficiently different, there is no motivation or suggestion for one skilled in the art to combine the solution of Skelly et al. for preventing spallation of new-make parts with Nagaraj et al. for improving adhesion of ceramic top coat to repair components removed from service that have experience localized damage to the top coats.

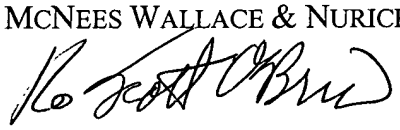
In summary, in addition to noncombinability considerations of references '078 and '971 under MPEP §§ 2141.01 III, 2141.02 and 2143.01 as previously discussed in the Appeal Brief, the references Nagaraj et al. ('078) and Skelly et al. ('971) resolve different problems (i.e., make-new articles (mass-produced new articles) versus used articles (individual; case-by-case treatment in a field environment); treating the entire article surface versus treating a specific, localized portion of an article) and are applied for different reasons (i.e., to prevent spalling in new articles versus providing a localized repair to a component, which has already experienced spalling). Appellants respectfully submit that the combination of references used by the Examiner to reject Appellants' claims is improper and only achieved by improper hindsight reasoning. Appellants further submit that this combination does not yield Appellants' invention as claimed.

Summary and Conclusion

When the claims are viewed against the cited references as a whole, Appellants' claims are not obvious. The Examiner arrives at this combination as a result of impermissible hindsight. Even, if proper, the combination does not yield Appellants' invention. Accordingly, favorable consideration of this appeal is respectfully requested.

Appellants respectfully request that the Board reverse the rejections.

Respectfully submitted,
McNees Wallace & Nurick LLC



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ENCLOSURES ***(check all that apply)***

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- ☐ Response to Missing Parts/ Incomplete Application
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